UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 1, 2014

Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
P.O. Box 250
Governor Hunt Road
Vernon, VT 05354

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION – REVIEW OF CERTIFIED FUEL HANDLER TRAINING AND RETRAINING PROGRAM (TAC NO. MF2988)

Dear Sir or Madam:

By letter dated October 31, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13325B015), Entergy Nuclear Operations, Inc. (the licensee), submitted its Certified Fuel Handler (CFH) Training and Retraining Program for the Vermont Yankee Nuclear Power Station (VY) to the U.S. Nuclear Regulatory Commission (NRC) for approval.

By letter dated September 23, 2013 (ADAMS Accession No. ML13273A204), the licensee submitted Notification of Permanent Cessation of Power Operations for VY. In this letter, Entergy provided notification to the NRC of its intent to permanently cease power operation at the end of the current operating cycle which is expected to occur in the fourth calendar quarter of 2014. After certifications of permanent cessation of power operations and of permanent removal of fuel from the reactor vessel for VY are submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(1)(i) and (ii), the 10 CFR 50 license will no longer authorize reactor operation or placement or retention of fuel in the reactor vessel. As a result, licensed reactor operators will no longer be required to support plant operating activities. Instead, approval of a Certified Fuel Handler Training and Retraining Program is needed to facilitate activities associated with decommissioning and irradiated fuel handling and management.

The licensee requested NRC approval of the VY CFH Training and Retraining Program to ensure that the monitoring, handling, storage and cooling of irradiated fuel is performed in a safe manner. As defined in 10 CFR 50.2, the Certified Fuel Handler is a non-licensed operator who has qualified in accordance with a fuel handler training program approved by the NRC. Non-licensed personnel are trained in accordance with 10 CFR 50.120.

The NRC has reviewed the submittals and approves the VY Certified Fuel Handler Training and Retraining Program as requested.

A copy of the related safety evaluation is enclosed.

If you have any questions, please contact me at 301-415-4125 or via e-mail at James.Kim@nrc.gov.

Sincerely,

James Kim

James Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosure:
As stated

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CERTIFIED FUEL HANDLER TRAINING AND RETRAINING PROGRAM

VERMONT YANKEE NUCLEAR POWER STATION

ENTERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated September 23, 2013 ((Agencywide Documents Access and Management System (ADAMS) Accession No. ML13273A204), Entergy Nuclear Operations, Inc. (the licensee) submitted Notification of Permanent Cessation of Power Operations for Vermont Yankee Nuclear Power Station (VY). In this letter, Entergy provided notification to the U.S. Nuclear Regulatory Commission (NRC) of its intent to permanently cease power operation at the end of the current operating cycle which is expected to occur in the fourth calendar quarter of 2014. After certifications of permanent cessation of power operations and of permanent removal of fuel from the reactor vessel for VY are submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(1)(i) and (ii), the 10 CFR 50 license will no longer authorize reactor operation or placement or retention of fuel in the reactor vessel. As a result, licensed reactor operators will no longer be required to support plant operating activities. Instead, approval of a Certified Fuel Handler Training and Retraining Program is needed to facilitate activities associated with decommissioning and irradiated fuel handling and management.

By letter dated October 31, 2013 (ADAMS Accession No. ML13325B015), the licensee, submitted its Certified Fuel Handler Training and Retraining Program for VY to the NRC for approval.

The proposed training and retraining program is to be used to satisfy training requirements for the plant personnel responsible for supervising and directing the monitoring, storage, handling, and cooling of irradiated nuclear fuel in a manner consistent with ensuring the health and safety of the public. Section 10 CFR 50.2 requires that CFHs be qualified in accordance with an NRC-approved training program.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance that the NRC staff used in its review of the VY CFH training and retraining program are as follows:

- Section 50.2 of 10 CFR, "Definitions," which states that *Certified Fuel Handler* means, for a nuclear power reactor facility, a non-licensed operator who has qualified in accordance with a fuel handler training program approved by the Commission.

- Section 50.120 of 10 CFR, "Training and qualification of nuclear power plant personnel," which states, in part, that:

  (b)(2) The training program must be derived from a systems approach to training as defined in 10 CFR 55.4, and must provide for the training and qualification of the following categories of nuclear power plant personnel:
  (i) Non-licensed operator.

  (b)(3) The training program must incorporate the instructional requirements necessary to provide qualified personnel to operate and maintain the facility in a safe manner in all modes of operation. The training program must be developed to be in compliance with the facility license, including all technical specifications and applicable regulations. The training program must be periodically evaluated and revised as appropriate to reflect industry experience as well as changes to the facility, procedures, regulations, and quality assurance requirements. The training program must be periodically reviewed by licensee management for effectiveness. Sufficient records must be maintained by the licensee to maintain program integrity and kept available for NRC inspection to verify adequacy of the program.

- Section 55.4 of 10 CFR, "Definitions," which states that "*Systems approach to training*" means a training program that includes the following five elements:

  (1) Systematic analysis of the jobs to be performed.
  (2) Learning objectives derived from the analysis which describe desired performance after training.
  (3) Training design and implementation based on the learning objectives.
  (4) Evaluation of trainee mastery of the objectives during training.
  (5) Evaluation and revision of the training based on the performance of trained personnel in the job setting."

- The Statements of Consideration for the "Decommissioning of Nuclear Power Reactors," Proposed Rule (60 FR [*Federal Register*] 37374), dated July 20, 1995, and Final Rule (61 FR 39278), dated July 29, 1996.

- SECY-00-145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," dated June 28, 2000.

3.0 TECHNICAL EVALUATION

3.1 CFH Training Program Broad-Scope Objectives

The 1996 "Decommissioning of Nuclear Power Reactors" rulemaking that codified the need for a CFH at decommissioning reactors recognized that the risks posed by permanently shutdown and defueled power reactors are significantly less than those posed by operating reactors. In that rulemaking, the Commission noted that:

- While the spent fuel is still highly radioactive and generates heat caused by radioactive decay, no neutron flux is generated and the fuel slowly cools as its energetic decay products diminish.

- The systems required for maintaining the spent fuel in the spent fuel pool as well as the operations required to contain the remaining residual contamination in the facility and spent fuel pool are relatively simple.

- Because the spent fuel is stored in a configuration that precludes the nuclear fission reaction, no generation of new radioactivity can occur and the potential for consequences that could result from an inadvertent nuclear reaction are highly unlikely.

Because of the reduced risks and relative simplicity of the systems needed for safe storage of the spent fuel, the Commission stated in the rulemaking that "[t]he degree of regulatory oversight required for a nuclear power reactor during its decommissioning stage is considerably less than that required for the facility during its operating stage."

In the rulemaking, the Commission also provided insights as to the responsibilities of the new position of the CFH. Specifically, the CFH is needed to ensure that emergency action decisions necessary to protect the public health and safety are made by an individual who has both the requisite knowledge and plant experience.

These CFH responsibilities were further affirmed in the NRC staff's proposed decommissioning rulemaking plan (SECY-00-145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," dated June 28, 2000). Although never voted on by the Commission, the paper provided the following insights on CFH responsibilities:

> A licensee that has docketed certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in [10 CFR] 50.82(a)(1), shall maintain staff with the qualifications and capabilities to safely conduct decommissioning activities along with safe handling and storage of spent fuel and respond to plant emergencies.

Considering the definition of Certified Fuel Handler in 10 CFR 50.2, the background provided by the 1996 decommissioning rule statements of consideration, and the insights provided in SECY-00-145, the NRC staff has determined that an acceptable CFH training program should

ensure that the trained individual has requisite knowledge and experience in spent fuel handling and storage, reactor decommissioning, and is capable of evaluating plant conditions and exercising prudent judgment for emergency action decisions. In addition, since the CFH is defined as a non-licensed operator, the NRC staff also used the criteria in 10 CFR 50.120 and assessed the program against the elements of a systems approach to training as provided in the definitions section of 10 CFR 55.4.

Based on the above, three broad-scope objectives are used as criteria for an acceptable CFH training program:

(1) Safe conduct of decommissioning activities
(2) Safe handling and storage of spent fuel
(3) Appropriate response to plant emergencies

The proposed training and retraining program was reviewed by the NRC staff. This program requires lectures and/or self-study activities, on-the-job training and testing related to the facility license (content, bases, and importance of Technical Specifications) as well as on procedures and facilities (refer to Sections 2.2; Section 2.3; and Appendices A and B of the VY CFH training and retraining program guide (TRPG) provided in the attachment to the licensee's letter dated October 31, 2013). The NRC staff finds inclusion of these topics to be consistent with objective (1) above.

The program also includes lectures and/or self-study activities, on-the-job training and testing related to the monitoring, handling, storage, and cooling of nuclear fuel (refer to Section 2.2 and Appendices A and B of the CFH TRPG). The NRC staff finds this to be consistent with objective (2) above.

The staff found that the training and retraining program includes a focus on the use of normal, abnormal, and emergency procedures. Also included, is training on accident analysis and the plant Emergency Plan. The staff finds this to be consistent with objective (3) above.

Therefore, the NRC staff concludes that the VY CFH training and retraining program meets all of the broad-scope objectives discussed above.

3.2 Training Program Evaluation

Following issuance of the 1996 decommissioning rule, the NRC commenced review and approval of CFH training programs for permanently shutdown and defueled reactors consistent with the requirements in the rule. Reactors that permanently shut down would reassess their staffing plans related to decommissioning organization structure; retaining, re-assigning or releasing staff; and meeting minimum staffing requirements in technical specifications and regulatory required programs (e.g., emergency response organizations, fire brigade size, security, etc.). The effort balanced personnel and plant status commensurate with the reduced risk once the certifications associated with permanent cessation of operation had been submitted. Included in the effort was the transition from licensed operators to CFHs. With a simplified operating configuration in the permanently shutdown and defueled condition, licensed operators were replaced with CFHs following NRC approval of the CFH training program.

Consistent with these changes, the training and requalification programs required by 10 CFR Part 55 were modified to reflect the reduced staffing levels and responsibilities of the operations staff. Past practice by the NRC related to review of a CFH training program (see NRC safety evaluations for Maine Yankee, dated November 26, 1997 (ADAMS Accession No. 9712040233), and Zion, dated July 20, 1998 (ADAMS Accession No. 9807240263) included confirming that the program was based on a systems approach to training (SAT) as defined in 10 CFR 55.4. On May 12, 2014, the NRC staff approved a CFH program for Kewaunee (ADAMS Accession No. ML14104A046). The staff reviewed the specific elements of the VY CFH training and retraining program against the regulatory requirements of 10 CFR 50.120(b)(2) and (b)(3), consistent with previous NRC staff reviews and approvals of decommissioning reactor CFH programs.

3.2.1 Systems Approach to Training Evaluation

Section 50.120(b)(2) states that training programs under this section must be derived using the systems approach to training as defined in 10 CFR 55.4. The licensee stated in its application dated October 31, 2013, that the CFH training and retraining program was designed to fulfill those requirements.

The NRC staff reviewed the CFH training and retraining program and found that the program includes all five of the required elements of a SAT-based program:

(1) Systematic analysis of jobs to be performed.
(2) Learning objectives derived from the analysis which describe desired performance after training.
(3) Training design and implementation based on the learning objectives.
(4) Evaluation of trainee mastery of the objectives during training.
(5) Evaluation and revision of the training based on the performance of trained personnel in the job setting.

In Section 2.2 of the VY CFH TRPG, the licensee's training/retraining program description states that selection of topic/learning objectives are based on a job analysis of the CFH tasks and function. A job analysis was performed for the Certified Fuel Handler tasks and functions. In a RAI response dated June 25, 2014, the licensee states that this job analysis was completed using VY's current Senior Reactor Operator (SRO) task list as a basis and evolving that task list into the new CFH task list based upon the reactor being permanently shutdown and defueled with all spent fuel in either the Spent Fuel Pool or the Independent Spent Fuel Storage Installation (ISFSI) pad. The DIF analysis was performed by training and operations personnel and management. Training requirements for CFH candidates are being identified based on these DIF ratings. The NRC staff finds this to be consistent with SAT elements (1) and (2) above to provide training and qualifications to the CFH.

In a Request for Additional Information (RAI) response dated June 25, 2014, (ADAMS Accession No. ML14183B258) the licensee states that applicable training materials and objectives are being selected for the required fundamentals topics, based on the new CFH tasks and their supporting knowledge requirements. Since the reactor will be permanently shutdown and defueled, only a subset of the current Generic Fundamentals Topics will need to be taught to CFH candidates. One output of the ongoing design phase of the CFH training program will

be a comprehensive list of required fundamental training topics and associated learning objectives. Qualified operations instructors are making these curriculum decisions based on the Difficulty, Importance, and Frequency (DIF) values generated by operations line incumbents. Operations and training management will review and approve the selection of curricula and objectives for the fundamental training topics. The NRC staff finds the licensee's plan to develop and implement training in accordance with the VY CFH TRPG will result in training that is consistent with SAT element (3) above.

In Section 2.4.1 of the VY CFH TRPG, the licensee's training/retraining program description states the trainees are evaluated by written exam requiring a minimum score of 80 percent to pass and an operating exam consisting of five Job Performance Measures with critical steps that form the bases for failure. The NRC staff finds that this meets SAT element (4).

Section 4.0 of the VY CFH TRPG requires completion of a routine assessment of the effectiveness and accuracy of training by appropriate management during and at the end of each 2-year training cycle. Evaluation results shall be reviewed by a station oversight board who will verify the resolution of any discrepancies identified by the evaluation. Any required changes to the program determined by the station oversight board, shall be incorporated into the program. The NRC staff finds this consistent with SAT element (5).

3.2.2 Training Program Evaluations Under 10 CFR 50.120(b)(3)

The NRC staff also verified that the licensee's CFH training and retraining program met the requirements of 10 CFR 50.120(b)(3). Specifically, 10 CFR 50.120(b)(3) requires that the training program:

a. incorporate the instructional requirements necessary to provide qualified personnel to operate and maintain the facility in a safe manner in all modes of operation;
b. be developed to be in compliance with the facility license, including all technical specifications and applicable regulations;
c. be periodically evaluated and revised as appropriate to reflect industry experience as well as changes to the facility, procedures, regulations, and quality assurance requirements;
d. be periodically reviewed by licensee management for effectiveness; and
e. ensure the licensee maintains and keeps available sufficient records to maintain program integrity and allow for NRC inspection to verify the adequacy of the program

The NRC staff reviewed the VY CFH training and retraining program and confirmed that each of the 10 CFR50.120(b)(3) requirements are satisfied as discussed below:

Appendix A and Appendix B of the VY CFH TRPG provides a compendium of instructional areas such as written and operating examination areas that the licensee has identified as required instructional areas necessary to ensure that the Certified Fuel Handlers will be trained in all areas necessary to maintain the facility and operate equipment in a safe manner. A job analysis was performed for the Certified Fuel Handler tasks and functions. In a RAI response dated June 25, 2014, the licensee states that this job analysis was completed using VY's current Senior Reactor Operator (SRO) task list as a basis and evolving that task list into the

new CFH task list based upon the reactor being permanently shutdown and defueled with all spent fuel in either the Spent Fuel Pool or the Independent Spent Fuel Storage Installation (ISFSI) pad. The DIF analysis was performed by training and operations personnel and management. The NRC staff finds this satisfies element a. above.

Training requirements for CFH candidates are being identified based on these DIF ratings. The regulations require that the training program must be developed to be in compliance with the facility license, including all technical specifications. Section 1.0 of the VY CFH TRPG states that the program will be in accordance with ANSI/ANS 3.1-1978, "American National Standard for Selection and Training of Nuclear Power Plant Personnel," consistent with the level of hazard at the facility and to ensure the facility is maintained in a safe and stable condition. The NRC staff finds this to be consistent with requirement b. above.

The VY CFH TRPG discussed that, as part of the training process, routine assessments of the effectiveness and accuracy of training are made by appropriate VY management personnel during and at the end of each 2-year training cycle. The training program requires that evaluation results be reviewed by a station oversight board as defined in site procedures. In addition, the station oversight board will verify the resolution of any discrepancies identified by the evaluation and ensure that required changes based on operating experience are incorporated into the program. This fulfills the requirement c. above, that the training program is to be periodically evaluated and revised.

The program evaluations are controlled by the station oversight board, include assessments both during and after training, and provide management oversight of both the effectiveness and accuracy of training, therefore, the NRC staff finds the biannual program evaluation satisfies requirement d. above for periodic management reviews for effectiveness.

In Section 5.0 of the VY CFH TRPG, the licensee's training/retraining program description states records associated with the VY CFH training and retraining program will be retained in retrievable format for the duration of the plant license. This satisfies the requirements of e. above, which states that sufficient records must be maintained to maintain program integrity.

4.0 CONCLUSION

The NRC staff review of the Vermont Yankee Certified Fuel Handler Training and Retraining Program determined that the programs address the safe conduct of decommissioning activities; safe handling and storage of spent fuel; appropriate response to plant emergencies; and is consistent with the SAT processes defined by 10 CFR 55.4 and the requirements of 10 CFR 50.120(b)(2) and (3). Based on the finding and conclusions discussed above, the NRC staff approves the VY CFH training and retraining program pursuant to 10 CFR 50.2. Because the program is based on SAT, the licensee may change elements without NRC approval as long as the following are applicable: (1) suitable proficiency in the performance of the program's activities is maintained; and (2) changes are documented in an accessible manner that will allow the NRC to verify the adequacy of the program in accordance with 10 CFR 50.120.

Principal Contributor: Molly Keefe
Date: October 1, 2014

The NRC has reviewed the submittals and approves the VY Certified Fuel Handler Training and Retraining Program as requested.

A copy of the related safety evaluation is enclosed.

If you have any questions, please contact me at 301-415-4125 or via e-mail at James.Kim@nrc.gov.

Sincerely,

/RA/

James Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

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